MICRO CASE 20 --- NOCARDIA ASTEROIDES (NOCARDIOSIS)

A 44 yo white man presented with a **3 mo history** of intermittent **fever, chills, and a cough production of GREEN SPUTUM**. He also complained about weakness, weight loss, chest pain, and shortness of breath. He had been given several courses of **ATBs without significant improvement** and had noted the presence of a headache for the past few weeks. He had a history of **COPD** and had been on **chronic steroids for the past 6 months**.

* LAB STUDIES
  + **Extensive nodular infiltrates in the RIGHT (UNILATERAL) middle and upper lobes and cavitary disease**
* DIAGNOSTIC WORK UP
  + Gram and acid fast stains of respiratory and biopsy
  + Cultures
  + In failed tests, fungal cultures and serology
* DIFFERENTIAL
  + Actinomyces; Aspergillosis; endemic mycosis (e.g. histoplasmosis); mycoplasma pneumonia; pneumococcus pneumonia; TB
  + Rationale: Focus should be on patient being immunocompromised. TB always considered with upper lobe disease and fungal causes often associated with chronic symptoms. Mycoplasma does not usually cause such UNILATERAL disease, and pneumococcus pneumonia is not usually a chronic infection.
* MICROBIOLOGIC PROPERTIES
  + Filamentous (beaded) bacteria belonging to actinomycetes
  + Gram positive
  + Weakly acid fast
  + Grow slowly (up to 4weeks!)
* EPIDEMIOLOGY
  + Inhalation of contaminated dust from a soil environment (exogenous).
  + Patients receiving cytotoxic or immunosuppressive drugs (especially steroids) and patients with AIDS are at high risk
  + **Madura foot** 🡪 in tropical countries nocardiosis occurs as a result of skin inoculation in agricultural workers, causing chronic subq infection and slow extension along lymphatics or destruction of deeper tissues
* PATHOGENESIS
  + Bacteria are inhaled and phagocytosed by neutrophils and macrophages but prevent phago-lysosome fusion and thus killing. Grow within phagocytosed cells. Major mechanisms for resistance to nocardia infection are activated macrophages and T cells🡪 **granulomatous formation.**
  + Host response causes symptoms. **The lung pathology in uncontrolled infection includes inflammatory endobronchial masses or diffuse pneumonitis and abscesse**s. CXR show nodules which **may cavitate when larger**.
  + If those with T cell def., the infection may spread to contiguous structures or disseminate. May have CNS involvement (abscesses form).
* TREATMENT
  + **Sulfonamides** (usually Bactrim) for 6-12 mos
  + Impenem and amikacin are alternatives
* PREVENTION
  + No vaccine
  + Improve immune status (steroids)